1,110,612

PATENT SPECIFICATION

NO DRAWINGS

1,110,612

Date of Application and filing Complete Specification: 25 March, 1966.

No. 13434/66.

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Index at acceptance:—A2 B1G; C5 C(9B9A(9B9B, 9B9C1, 9BX, 9E1, 9E2, 9E3, 9E4)

Int. Cl.:—A 23 l 1/30

COMPLETE SPECIFICATION

Enriched Foodstuff and production thereof

We, SUMITOMO CHEMICAL CO., LTD., a corporation organized under the laws of Japan, of 15, 5-chome, Kitahama, Higashi-ku, Osaka, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to foods enriched with higher unsaturated fatty acid amides and their production.

Not only in Europe and America but also recently in Japan, there are greatly increasing incidences of hyperchlolesterolemia and atheroscrelosis linked up with increase in intake of animal fats resulting from remarkably improved dietary life, and extremely important problems in this connection have arisen in medical and sociological circles.

Thousands of etiological studies on atheroscrelosis have been made, and it is widely accepted that one of the most important causes of angiopathia is deposition of cholesterol in blood vessels. There is possibility of increase in blood-cholesterol level by intake of a large amount of foods containing chloesterol such as meat, egg, butter, margarine, cheese, beef tallow, lard, ice cream, cream and milk, and foods containing higher saturated fatty acids, e.g. frying oils and salad oils. High blood-cholesterol level may cause deposition of cholesterol in blood. Furthermore, consumption of the said foods has a tendency to increase remarkably with the years, and thus the afore-mentioned diseases have been constantly increasing under present conditions.

Accordingly, it is of extremely important significance to make available improved foods, which do not directly cause atheroscrelosis and which may prevent the said disease, by appropriately enriching the afore-mentioned foods and other daily foods. Furthermore, such enriched foods are desirable because it is eays for daily intake.

According to the present invention, there is provided a foodstuff having incorporated therein at least one amide of an unsaturated fatty acid having 16 to 24 carbon atoms and 1 to 8 double bonds in the molecule.

It is a characteristic of the present invention that foods appropriately enriched for the hereinbefore described purposes are obtained by adding the said higher unsaturated fatty acid amides to fatty foods and other dairy foods.

The higher unsaturated fatty acids residues of the compounds of the present invention may be single or mixed fatty acids substantially consisting of higher unsaturated fatty acids having 16 to 24 carbon atoms and 1 to 8 double bonds such as palmitoleic acid, oleic acid, linoleic acid, linolenic acid, ricinoleic acid and arachidenic acid, fatty acids of hemp seed oil, linseed oil, perilla oil, Kaya oil, walnut oil, poppy seed oil, safflower oil, watermelon seed oil, coybean oil, sunflower oil, rice bran oil, pumpkin seed oil, kaoliang oil, sesame oil, corn oil, rape oil, cotton seed oil, olive oil, cashew nut oil, Tsubaki oil, oil of ergot, castor oil, peanut oil, palm oil, palm kernel oil, coconut oil, beef tallow, lard, bone oil, horse fat, locust oil, chrysalis oil, shark oil, whale oil, cuttle fish oil, sardine oil, mackerel oil, skipper oil, herring oil, horse mackerel oil, cod oil, trout oil, gray mullet oil, tunny fish oil, Menuke oil, menhaden oil, eel oil, plaice oil, residual oil, liver oil, body oil, skin oil and brain oil. However, a small amount of saturated fatty acids such as myristic acid, palmitic acid and stearic acid may be contaminated without affording any unfavourable effect on the accomplishment of the present invention.

On the other hand, amine residues forming the said amides may be selected from the following amines: alkyl amines such as mono- and dimethylamines, mono- and diethylamines, mono- and di-*n*-propylamines, mono- and diisopropylamines, mono- and di-*n*-butylamines, mono- and diisobutylamines, mono- and di-*tert*-butylamines, mono- and didodecyl-

[*Price 4s. 6d.*]

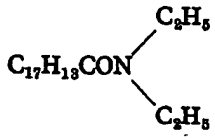
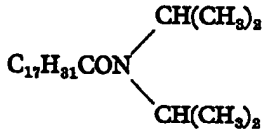
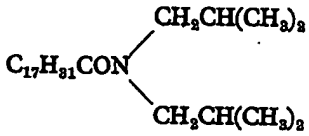
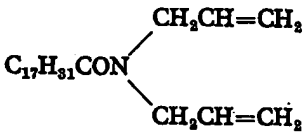
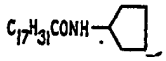
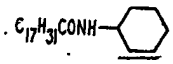
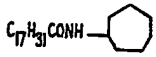
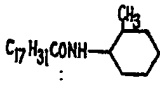
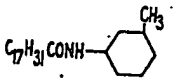
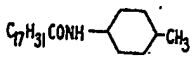
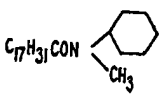
amines, mono- and di-palmtylamines and momo- and distearylamines alkenyl amines such as mono- and diallylamines, mono- and dicrotonylamines, mono- and dioleylamines and mono- and dilinoleylamines and other alkenyl amines; mono- or di-cyclo-pentylamine, cyclohexylamine and cycloheptylamine; cyclopentylamines, cyclohexylamines and cycloheptylamines substituted in a simple or complex manner with lower alkyl such as methyl, ethyl, *n*- and isopropyl and *n*-, *iso*- and *tert*-butyl, lower alkoxy such as methoxy ethoxy, *n*- and *iso*propoxy and *n*- iso- and *tert*-butoxy, hydroxyl and lower alkyl such as methyl, ethyl, *n*- and isopropyl and *n*-, *iso*- and *tert*-butyl at the N-position; aniline; diphenylamine; anilines substituted in a simple or complex manner with lower alkyl such as methyl, ethyl, *n*- and isopropyl and *n*-, *iso*- and *tert*-butyl at the N-position, hydroxyl, alkyl such as methyl, ethyl, n- and isopropyl and *n*-, *iso* and *tert*-butyl, lower alkoxy such as methoxy, ethoxy, *n*- and isopropoxy and *n*-, *iso*-and *tert*-butoxy, halogen such as fluorine, bromine, chlorine and iodine and trifluoromethyl; benzylamine; dibenzylamine; benzylamines substituted in a simple or complex manner with lower alkyl such as methyl, ethyl, *n*- and *iso*propyl and *n*-, *iso*- and *tert*-butyl at the N-position, lower alkyl such as methyl, ethyl, *n*- and *iso*propyl and *n*-, *iso*- and *tert*-butyl at the alpha-position, hydroxyl, lower alkyl such as methyl, ethyl, *n*- and *iso*-propyl and *n*- *iso*- and *tert*-butyl and lower alkoxy such as methoxy, ethoxy, *n*- and *iso*-propoxy and *n*- *iso*- and *tert*-butoxy; heterocyclic amines such as pyrrole, pyrrolidine, morpholine, piperidine, piperazine, hexamethyleneimine and adamantylamine.

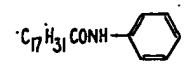
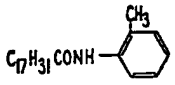
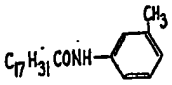
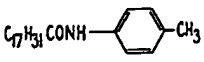
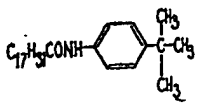
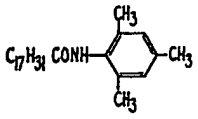
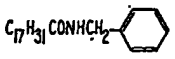
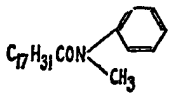
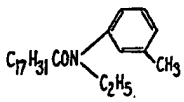
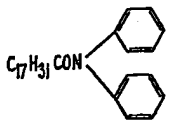
The higher unsaturated fatty acid amides employed as enriching additives to foodstuffs, according to the present invention are either known or can be prepared in *per se* conventional manner—e.g. by the dehydration method, the acid halide method, the aminolysis method, (etc.)—from the higher unsaturated fatty acids or reactive derivatives thereof such as the halides and esters, or from natural fatty acid glycerides, by reaction with the appropriate amines. Preferable methods for producing these higher unsaturated fatty amides are described in more detail in British Specification Nos. 1,057,742 and 1,051,286.

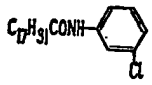
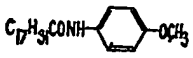
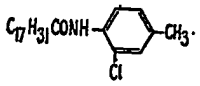
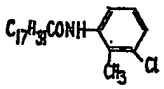
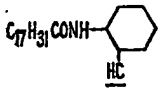
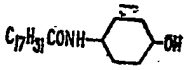
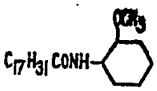
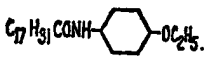
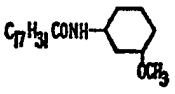
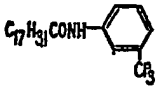
The higher unsaturated fatty acid amides used in the present invention themselves possess extremely superior effectiveness in reducing the elevated level of cholesterol in the blood and preventing atherosclerosis without appreciable toxicities as compared with known cholesterol lowering agents.

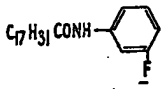
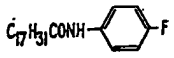
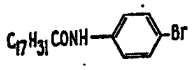
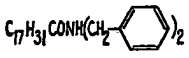
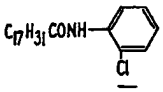
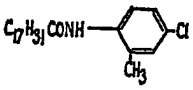
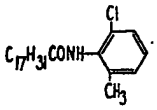
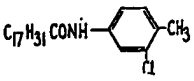
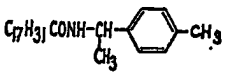
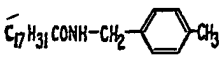
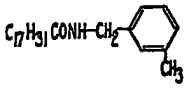
The effectivenesses of the present higher fatty acid amide compounds are set forth below.

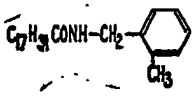
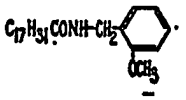
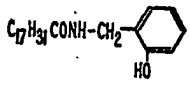
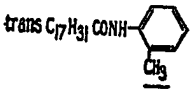
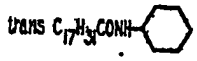
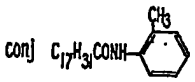
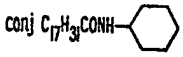
Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
None (control)	100	
Linoleic acid	74 — 78	101 — 104
$C_{17}H_{31}CONH—C_2H_5$	72	104
$C_{17}H_{31}CONH—CH(CH_3)_2$	67	85
$C_{17}H_{31}CONHCH_2CH(CH_3)_2$	—	93
$C_{17}H_{31}CONHCH\ CH=CH_2$	28	63
$C_{17}H_{31}CONHC_{12}H_{25}$	—	80
$C_{17}H_{31}CON(CH_3)_2$	67	80

Agents	Blood cholesterol level 1% administ.	0.2% administ.
	59	82
	76	80
	63	86
	41	86
	42	68
	47	55
	40	55
	56	96
	65	89
	47	93
	37	54

Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
	59	70
	39	50
	58	88
	71	92
	62	70
	33	72
	52	77
	61	86
	54	81
	43	66
	43	59

Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
	75	90
	—	82
	20	58
		67
	46	61
	50	63
	79	94
	64	82
	60	90
	52 (0.4%)	80
	56 (0.8%)	75
	72	85

Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
	78	93
	80	96
	79	86
	67	
		67
		46
	35	44
	42	
	39	78
	55	
	56	

Agents	Blood cholesterol level 1% administ.	0.2% administ.
		64
		70
		71
	72	
	60	
	69	
	39	80
N-isopropyl linseed fatty acid amide	70	85
N-allylsoybean fatty acid amide	32	61
N-(3-methylcyclohexyl)-sesame oil fatty acid amide	63	89
N-(2-propylcyclohexyl)peanut oil fatty acid amide	63	87
NN-methyl cyclohexyl fish liver oil fatty acid amide	35	52
N-tetramethylene shark oil fatty acid amide	41	58
N-morpholin cuttle fish oil fatty acid amide	—	85
N-*m*-tolyl sardine oil fatty acid amide	70	85

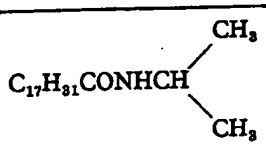
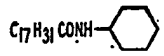
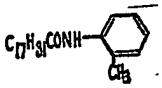
Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
N-o-methoxyphenyl whale oil fatty acid amide	45	71
N-*p*-hydroxyphenyl sperm blubber oil fatty acid amide		
N-cyclohexyl cuttle fish oil fatty acid amide	—	76
N-*o*-tolyl cuttle fish oil fatty acid amide		
N-cyclohexyl shark oil fatty acid amide	—	82
N-*o*-tolyl shark oil fatty acid amide	75	87
N-cyclohexyl whale oil fatty acid amide	—	79
N-cyclohexyl linseed oil fatty acid amide	59	82
N-*o*-tolyl linseed oil fatty acid amide	66	92
N-cyclohexyl rape oil fatty acid amide	62	99
N-*o*-tolyl soybean oil fatty acid amide	45	70
N-*o*-tolyl corn oil fatty adid amide	52	81
N-cyclohexyl corn oil fatty acid amide	63	80
N(*m*-methylbenzyl)sunflower oil fatty acid amide	—	64
N(4-methoxycyclohexyl) cod oil fatty acid amide	52	80
N-(cyclopentyl) safflower oil fatty acid amide	42	70
N-(cyclohexyl)sunflower oil fatty acid amide	45	58
N-(4-methylcyclohexyl) sesame oil fatty acid amide	54	95
N-(2-ethylcyclohexyl) rape oil fatty acid amide	60	85
N-(2-hedroxycyclohexyl) olive oil fatty acid amide	76	90
N-(cycloheptyl) chrysolis oil fatty acid amide	47	71
N-hexamethyleneimide of cuttle fish oil fatty acid amide	64	80
N-phenylmackarel oil fatty acid amide	60	94
N-diphenyl cod residual oil fatty acid amide	51	67
NN-methylphenyl sperm head oil fatty acid amide	63	88
N(3,4-dichlorophenyl)-cod oil fatty acid amide	42	81
N-(4-ethoxycyclohexyl)cotton seed oil fatty acid amide	54	81
N-(2-methylbenzyl) chrysalis oil fatty acid amide	68	73

Agents	Blood cholesterol level	
	1% administ.	0.2% administ.
N-(40ethoxybenzyl)-plaice oil fatty acid amide	60	73
Piperidide of soybean oil fatty acid	75	90
N-(2,4,6-trimethylphenyl) bran oil fatty acid amide	35	74
N-(oleyl) safflower fatty acid amide	64	82
N-(*o*-chlorophenyl) horse mackerel oil fatty acid amide	67	76
N-(diallyl) saury pile oil fatty acid amide	40	85
N-dioenzyl corn oil fatty acid amide	52	75
N-(*p*-methoxybenzyl) cod liver oil fatty acid amide	50	72
N-(*o*-hydroxybenxyl) whale oil fatty acid amide	50	73

The effectiveness were tested by use of mice fed on a special diet which was enriched with cholesterol and bile acids. The blood cholesterol level of the mice had been elevated to 3 to 6 times as much value as normal level. The fatty acid amides compound was well mixed to the specific diet in 1% or 0.2% amount, and continuously administrated orally for 8 to 12 days. Then the total cholesterol value in the blood serum of the animals was quantitated. The value was calculated to obtain the blood cholesterol level indexes taking the same value of the animals of control group, to which no agent was administered, as 100.

Another significant effectiveness of the N-substituted fatty acid amide compounds according to the present invention is to prevent the deposition of cholesterol and fat to the liver, which occurs in animals fed on cholesterol diet. It seems that the linoleamide compounds improve the declined lipid-metabolism function of the liver. This effectiveness is also favourable, in view of the fact that the metabolism of lipid mainly relies upon the function of the liver. In linoleic acid, such effectiveness is never observed.

The extremely low toxicities of the present fatty acid amide compounds, which are also the features of the present invention, were confirmed by acute and chronic toxicity studies carried out on laboratory animals. As the result of acute toxicity test, it was found that any of these compounds has no significant toxic effect on mice administered with such an abundant dose as 50 g/kg of the body weight. In chronic toxicity test, any of significant toxic effect, as well as mortal case, was not observed, when rats have been placed on the commercial diet supplemented with N-cyclohexyl safflower oil fatty acid amide or N-cyclohexyl sardine oily fatty acid amide in levels of 2%.1% or 5% for 6 months. There was observed no difference in body weight gain compared with that of control group and no detectable change was found by hematologican and histological examination. Furthermore, these compounds have no noticeable chronic toxicity. For example, each of N-cyclohexyllinoleamide and N-cyclohexyl-safflower fatty acid amide was administered to rats for 6 months as diet containing 2% of the compound, to dogs for 6 months in an amount of 1 g/kg, to monkeys for 29 days in an amount of 1 g/kg and to mice for 4 months as diet containing 0.5% of compound, but no pathological and histological abnormality was observed in main internal organ. There was observed no abnormality in liver functions and haematological analyses.

Agents	LD_{50} values (g/kg) oral	intraperitoneal
	>50	1.0
	>50	9.0
	>50	10.5
Linoleic acid	>50	<1.0

As is seen from the above Table, no fatality and no significant toxic symptoms were observed even in such abundant dose (per os) as 0.5 g. per 10 g., namely g/kg of the body weight. Also, any of significant toxic symptoms, as well as fatality, were not observed when N-cyclohexyl- or N-2-methylphenyllinoleamide in 1%, 0.5% or 2% amount in diet was administered to mice everyday for 3 weeks. The appetite was normal and the digestive function remained unchanged. When the internal organs were inspected by dissection, there was no appreciable change. This was the same in the tests of N-2-methylphenyllinolemide by use in rats.

Foods into which the acid amides may be incorporated in line with the object of the present invention are as follows: Dairy products such as butter, margarine, cheese, cream, ice cream, skim milk, dry milk and milk; animal and vegetable edible oils such as frying oils, salad oils, mayonnaise and lard; cereal and related foods such as vermicelli, bread, crackers, biscuits, wheat flour, starch, rice, rice flour, dough, buckwheat flour and miso (Japanese bean paste); confectionaries such as caramels, chocolate, chewing gum, wheat-glutens and candies; processed meat and fish such as ham, sausages and pasty products.

Because of their low toxicity, the aforesaid higher unsaturated fatty acid amides can be admixed with the said foods in an extremely wide range of proportion and should be appropriately used depending on the amount and the frequency of intake of the food to be employed. For example, cream or the like, the intake of which is usually small may contain a higher percentage of the said amides, whereas wheat flour and rice flour, the intake of which is rather large may contain a lower percentage of the said amides. Generally, the range varies from about 0.1% to about 80% by weight of the enriched foodstuff.

The intake amount of the active ingredient (acid amide) in the foodstuff is preferably about 10g. per day at the maximum.

In admixing of compounding the said amides, there may be added without prejudicially influencing the accomplishment of the present invention other commonly-used additives such as natural or synthetic emulsifying agents for foods (e.g. lecithin, sorbitan, sucrose esters, fatty acid monoglycerides), antioxidants for foods (e.g. BHT, BHA (butylated hydroxyanisole), tocopherols, propyl gallate, nordihydroguaiaretic acid), colouring agents, flavours, seasonings and water.

For example, in applying the present invention to margarine, fats such as beef tallow, lard and a hardened oil (e.g. hardened corn oil) are admixed with oils such as soybean oil, peanut oil, cotton seed oil and safflower oil in a compounding machine so as to prepare a product of suitable melting point and, to the resulting mixture, there is added an appropriate amount of the above-mentioned amides according to the necessity and the object in

view, a colouring agent, aqueous sodium chloride solution, an emulsifying agent, an antioxidant and the like. Then, the resultant mixture is vigorously agitated in an emulsifier at a temperature a little higher than the melting point and rapidly chilled in a chilling machine to obtain enriched margarine.

Since the higher unsaturated fatty acid amides used in the process of this invention are extremly soluble in fats, the said amides can be admixed with edible oils and the like by simply agitating the mixture in a compounding machine, if necessary, with slight warming.

Addition to powdered foods such as wheat flour and rice flour may be carried out by mixing the foods and the said amides in a mill or a compounding machine. If necessary, the amides may be added in the form of a solution in an inert organic solvent such as ethyl alcohol or a vegetable oil.

Enriched bread, enriched wheat vermicelli, enriched crackers and enriched biscuits may be prepared by *per se* conventional procedures using wheat flour, buckwheat flour or the like previously admixed with the said amides.

According to the process of the present invention, a foodstuff such as enriched rice can be prepared by admixing rice and the like coated with the said amides with untreated rice or by mixing the particles made of the said amides, wheat flour, cellulose acetate, gum arabic, rice powder and the like with untreated rice.

Since the higher unsaturated fatty acid amides are tasteless and odourless, the enriched foods disclosed above have the same taste as the original foods; if anything, the amides rather add a smooth feeling to the tongue to improve the appetite.

Moreover, the said amide derivatives which have high decomposition temperatures, do not decompose at the usual frying-temperatures and are not hydrolyzed with acids and alkalis thus no free amines are liberated.

The following examples of presently preferred embodiments are shown for illustration of the present invention. Percentages in the examples are by weight. Parts are by weight.

EXAMPLE 1.

A mixture of soybean oil (70 to 80%), hardened corn oil (10 to 20%), N-cyclohexyllinoleleamide (1 to 5%), sorbitan (1%), an aqueous solution of sodium chloride (about 10%), BHT (butylated hydroxytoluene), a flavour, and a colouring agent is vigorously agitated in an emulsifier at 50°C., then rapidly chilled in a chilling machine and shaped to prepare enriched margarine.

EXAMPLE 2.

A salad oil (olive oil, cottonseed oil, etc.) is mixed with 20 to 30% of N-isopropyllinoleamide in a mixer at 40 to 50°C. To the resulting mixture, there is added about 0.1% of BHT to prepare an enriched oil.

EXAMPLE 3.

N-*alpha*-methylbenzyllinoleamide (1 part) is added to wheat flour (100 parts), and the mixture is agitated and mixed well in a mill. The thus-obtained enriched wheat flour can be employed for making bread and wheat vermicelli according to conventional procedures. It also can be kneaded with water (50 parts), made into particles, dried and admixed with rice to prepare enriched rice.

EXAMPLE 4.

A mixture of cotton seed oils (40 to 50 parts), N-cyclohexyllinoleamide (40 to 50 parts), sorbitan (1%), aqueous solution of sodium chloride (ca. 10%) and a small amount of BHT, flavour and colouring agent is vigorously agitated in an emulsifier at 50°C. The mixture is then rapidly chilled and shaped to prepare an enriched margarine.

EXAMPLE 5.

N,N-diphenyllinoleamide (20 parts) and dry milk (80 parts) are mixed together with 0.1% BHT and 0.01% vitamin C-palmitate to prepare enriched dry milk.

EXAMPLE 6.

Cuttle fish oil fatty acid cyclohexylamide (20 parts) and a salad oil (80 parts) are mixed at 50°C. to prepare an enriched salad oil.

EXAMPLE 7.

Safflower oil fatty acid cyclohexylamide (20 parts) and a salad oil (80 parts) are mixed at 50°C. to prepare an enriched salad oil.

EXAMPLE 8.

Safflower oil fatty acid cyclohexylamide (20 parts) and a fry oil (80 parts) are mixed at 50°C. to prepare an enriched fry oil.

EXAMPLE 9.

N-tetramethylenelinoleamide (10 parts) and a frying oil (90 parts) are mixed at 50°C. to prepare an enriched fry oil.

EXAMPLE 10.

N,N - methyl - cyclohexyllinoleamide (30 parts) and a lard (70 parts) are mixed at 50°C. to prepare an enriched lard.

EXAMPLE 11.

N - (*alpha* - methylbenzyl)linoleamide (20 parts) and a lard (80 parts) are mixed at 50°C. to prepare an enriched lard.

EXAMPLE 12.

Except safflower oil fatty acid cyclohexyllinoleamide (40 parts) and soybean oil (50 parts) are used, the same procedure as Exam-

ple 1 is conducted to prepare enriched margarine.

EXAMPLE 13.

Soybean oil fatty acid o-methoxyphenylamide (10 parts) and wheat flour (90 parts) are mixed to prepare enriched wheat flour.

WHAT WE CLAIM IS:—

1. A foodstuff having incorporated therein at least one amide of an unsaturated fatty acid having 16 to 24 carbon atoms and 1 to 8 double bonds in the molecule.

2. A foodstuff according to claim 1, wherein the fatty acid residue of the fatty acid amide is derived from palmitoleic acid, oleic acid, linoleic acid, linolenic acid, ricinoleic acid and arachidonic acid, fatty acids of hemp seed oil, linseed oil, perilla oil, oiticica oil, Kaya oil, walnut oil, poppy seed oil, safflower oil, watermelon seed oil, soybean oil, sunflower oil, rice bran oil, pumpkin seed oil, kaoliang oil, sesame oil, corn oil, rape oil, cotton seed oil, olive oil, Cashew nut oil, Tsubaki oil, oil of ergot, castor oil, peanut oil, palm oil, palm kernel oil, coconut oil, beef tallow, lard, bone oil, horse fat, locust oil, chrysalis oil, shark oil, whale oil, cuttle fish oil, sardine oil, mackerel oil, skipper oil, herring oil, horse mackerel oil, cod oil, trout oil, gray mullet oil, tunny fish oil, Menuke oil, menhaden oil, eel oil, plaice oil, residual oil, liver oil, body oil, skin oil, or brain oil and the amine residue is derived from an alkylamine, an alkenyl amine, an unsubstituted or substituted cycloalkylamine, diphenylamine, substituted anilines, benzylamine, dibenzylamine, substituted benzylamines or heterocyclic amine.

3. A foodstuff according to claim 2, wherein the alkyl amine is mono- or dimethylamine, mono- or diethylamine, mono- or di-*n*-propylamine, mono or di *iso* propylamine, mono - or - di-*n*-butylamine, mono- or di*iso*-butylamine, mono- or di -*tert*-butylamine, mono- or dididecylamine, mono- or dipalmitylamine and mono- or distearylamine.

4. A foodstuff according to claim 2, wherein the alkenylamine is mono- or diallylamine, mono- or dicrotonylamine, mono- or dioleylamine.

5. A foodstuff according to claim 2, wherein the cycloalkylamine is a unsubstituted or substituted mono- or dicyclopentylamine, cyclohexylamine, cycloheptylamine in which the substituents are lower alkyl or lower alkoxy groups containing 1 to 4 carbon atoms or hydroxyl groups.

6. A foodstuff according to claim 2, wherein the substituted aniline is an N-substituted aniline in which the substituents are lower alkyl groups containing 1 to 4 carbon atoms of a C- substituted aniline in which the substituents are lower alkyl or lower alkoxy groups containing 1 to 4 carbon atoms, hydroxyl groups, halogen groups, or trifluoromethyl groups.

7. A foodstuff according to claim 2, wherein the substituted benzylamine is a N-substituted benzylamine in which the substituents are lower alkyl groups containing 1 to 4 carbon atoms, an alpha- substituted benzylamine in which the substituents are lower alkyl groups containing 1 to 4 carbon atoms or a C- substituted benzylamine in which the substituents are lower alkyl or lower alkoxy groups containing 1 to 4 carbon atoms, or hydroxyl groups.

8. A foodstuff according to claim 1 wherein the heterocyclic amine is pyrrol, pyrollidine, morpholine, piperidine, piperazine, hexamethyleneimine or adamantylamine.

9. A foodstuff according to claim 1 wherein the foodstuff is a dairy product, edible animal oil, vegetable oil, cereal product, confectionary, bakery product, processed meat product or processed fish product.

10. A foodstuff according to claim 1 wherein the quantity of unsaturated fatty acid amide is in the range of from 0.1 to 80% by weight of the foodstuff.

11. A method of producing an enriched foodstuff which comprises incorporating therein at least one amide of an unsaturated fatty acid having 16 to 24 carbon atoms and 1 to 8 double bonds in the molecule.

12. A method according to claim 11, wherein the amide of the fatty acid is as defined in any one of claims 2 to 8.

13. A method according to claim 11 wherein the foodstuff is a dairy product, edible animal oil, edible vegetable oil, cereal product, confectionary, bakery product, processed meat product or processed fish product.

14. A method according to claim 11 wherein the quantity of unsaturated fatty acid amide to be incorporated is from 0.1 to 80% by weight of the foodstuffs.

15. A method of imparting anti-cholesteroleimiatic activity to foodstuff, which comprises incorporating therein from 0.1 to 80% by weight of the foodstuff of an amide of an unsaturated fatty acid having 16 to 24 carbon atoms and 1 to 8 double bonds in the molecule.

16. A foodstuff whenever prepared by the process according anyone of claims 11 to 15.

17. A foodstuff according to claim 1 and substantially as hereinbefore-described with reference to the Examples.

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